ANNALS OF NATURAL HISTORY.

I.—*On the Production of Vanilla in Europe.* By Professor Charles Morren, of the University of Liége, Member of the Royal Academy of Sciences of Brussels, &c.*

THE natural history of Vanilla cannot have too many facts brought in aid of its illustration, because it is to be remarked that all the relations of travellers with regard to this plant serve rather to perplex than to throw light upon the subject. Having been fortunate enough to obtain two years since, and at two different times, an abundant crop of this interesting fruit, I believe I may assert that henceforth we may produce in Europe vanilla of as good a quality (if not better) as that which is exported from Mexico. This result is owing to the progress that vegetable physiology has made during these last few years, for, without an exact knowledge of the organs and of their functions, the fruit of this plant could never have been obtained; on this account this new culture deserves particular attention. In the second place, the experiments made at the Botanic Garden of Liége upon the fecundation of the flowers of the *Vanilla* have revealed several new facts in the physiology of the reproduction of plants. And, as regards the distinction of species, my inquiries may moreover serve to establish better diagnoses between the plants of the genus *Vanilla*, at the same time that they tend to prove that the latest works that treat of these species are far from giving correct information respecting the origin of the vanillas most in demand in commerce. Lastly, my experiments may afford the most convincing proof, that in our own climate, but in our hot-houses, the same circumstances of the ambient atmosphere as those which exist under a Mexican sky, produce in the vanilla plant all the phænomena of a good and perfect maturation of the fruit.

* Read before the British Association at Newcastle, and since communicated by the author to, and translated for this Journal.

ANNALS OF NATURAL HISTORY.

I.—*On the Production of Vanilla in Europe.* By Professor Charles Morren, of the University of Liége, Member of the Royal Academy of Sciences of Brussels, &c.*

THE natural history of Vanilla cannot have too many facts brought in aid of its illustration, because it is to be remarked that all the relations of travellers with regard to this plant serve rather to perplex than to throw light upon the subject. Having been fortunate enough to obtain two years since, and at two different times, an abundant crop of this interesting fruit, I believe I may assert that henceforth we may produce in Europe vanilla of as good a quality (if not better) as that which is exported from Mexico. This result is owing to the progress that vegetable physiology has made during these last few years, for, without an exact knowledge of the organs and of their functions, the fruit of this plant could never have been obtained; on this account this new culture deserves particular attention. In the second place, the experiments made at the Botanic Garden of Liége upon the fecundation of the flowers of the *Vanilla* have revealed several new facts in the physiology of the reproduction of plants. And, as regards the distinction of species, my inquiries may moreover serve to establish better diagnoses between the plants of the genus *Vanilla*, at the same time that they tend to prove that the latest works that treat of these species are far from giving correct information respecting the origin of the vanillas most in demand in commerce. Lastly, my experiments may afford the most convincing proof, that in our own climate, but in our hot-houses, the same circumstances of the ambient atmosphere as those which exist under a Mexican sky, produce in the vanilla plant all the phænomena of a good and perfect maturation of the fruit.

* Read before the British Association at Newcastle, and since communicated by the author to, and translated for this Journal.

ANNALS OF NATURAL HISTORY.

I.—*On the Production of Vanilla in Europe.* By Professor Charles Morren, of the University of Liége, Member of the Royal Academy of Sciences of Brussels, &c.*

THE natural history of Vanilla cannot have too many facts brought in aid of its illustration, because it is to be remarked that all the relations of travellers with regard to this plant serve rather to perplex than to throw light upon the subject. Having been fortunate enough to obtain two years since, and at two different times, an abundant crop of this interesting fruit, I believe I may assert that henceforth we may produce in Europe vanilla of as good a quality (if not better) as that which is exported from Mexico. This result is owing to the progress that vegetable physiology has made during these last few years, for, without an exact knowledge of the organs and of their functions, the fruit of this plant could never have been obtained; on this account this new culture deserves particular attention. In the second place, the experiments made at the Botanic Garden of Liége upon the fecundation of the flowers of the *Vanilla* have revealed several new facts in the physiology of the reproduction of plants. And, as regards the distinction of species, my inquiries may moreover serve to establish better diagnoses between the plants of the genus *Vanilla*, at the same time that they tend to prove that the latest works that treat of these species are far from giving correct information respecting the origin of the vanillas most in demand in commerce. Lastly, my experiments may afford the most convincing proof, that in our own climate, but in our hot-houses, the same circumstances of the ambient atmosphere as those which exist under a Mexican sky, produce in the vanilla plant all the phænomena of a good and perfect maturation of the fruit.

* Read before the British Association at Newcastle, and since communicated by the author to, and translated for this Journal.

ANNALS OF NATURAL HISTORY.

I.—*On the Production of Vanilla in Europe.* By Professor Charles Morren, of the University of Liége, Member of the Royal Academy of Sciences of Brussels, &c.*

THE natural history of Vanilla cannot have too many facts brought in aid of its illustration, because it is to be remarked that all the relations of travellers with regard to this plant serve rather to perplex than to throw light upon the subject. Having been fortunate enough to obtain two years since, and at two different times, an abundant crop of this interesting fruit, I believe I may assert that henceforth we may produce in Europe vanilla of as good a quality (if not better) as that which is exported from Mexico. This result is owing to the progress that vegetable physiology has made during these last few years, for, without an exact knowledge of the organs and of their functions, the fruit of this plant could never have been obtained; on this account this new culture deserves particular attention. In the second place, the experiments made at the Botanic Garden of Liége upon the fecundation of the flowers of the *Vanilla* have revealed several new facts in the physiology of the reproduction of plants. And, as regards the distinction of species, my inquiries may moreover serve to establish better diagnoses between the plants of the genus *Vanilla*, at the same time that they tend to prove that the latest works that treat of these species are far from giving correct information respecting the origin of the vanillas most in demand in commerce. Lastly, my experiments may afford the most convincing proof, that in our own climate, but in our hot-houses, the same circumstances of the ambient atmosphere as those which exist under a Mexican sky, produce in the vanilla plant all the phænomena of a good and perfect maturation of the fruit.

* Read before the British Association at Newcastle, and since communicated by the author to, and translated for this Journal.

§ I. *Of the species of Vanilla Plant which produces the long and fine pods of Commerce.*

Were we to believe most authors, (and I may even go so far as to say all) the *Vanilla aromatica* of Swartz, described by Robert Brown in the 'Hortus Kewensis' (vol. v.), would be the only one which produces the vanilla of commerce. This should have been the species introduced into Europe in 1739 by Henry Philip Miller; but it appears that it is not at all to be found at the present time in England, for I sought for it in vain in the gardens of London and its environs. I did not see it at Kew. It appears moreover that several species are confounded under this name, as M. Schiede has already pointed out in his *botanical observations* made in Mexico (Linnæa, vol. iv. 1829, p. 554—583), for, as he says, in Kunth's 'Synopsis,' we find assembled under this name Mexican species and others from Southern and Western America. The character which has been assigned to it of having nerved leaves (*foliis nervosis*) may possibly have arisen from bad culture, for in this case the *Vanilla planifolia* also has nerved leaves; or because dry leaves have been examined; for then again the leaves of the *Vanilla planifolia* are no longer smooth, but much wrinkled longitudinally, that is to say nerved. In short, the assertion that the pods of the vanilla of commerce are produced by the *Vanilla aromatica* rests upon no certain or known fact, but in a great measure upon the belief which existed that the *Vanilla planifolia* bore no odoriferous fruit, a thing which my own researches have proved to be completely false.

It is singular that there is not a better agreement with regard to the *Vanilla planifolia*, especially since the publications of M. Schiede. This botanist thinks that two distinct species are confounded under this name, both of which he found in Mexico; the one, the *Vanilla sativa*, Schiede, the leaves of which are oblong, succulent, the bracteæ small, and the *fruit without grooves*; and the other, the *Vanilla sylvestris*, Schiede, the leaves of which are oblong-lanceolate, succulent, the bracteæ small, and the *fruit with two grooves*. It is to be regretted that M. Schiede should have confined him-

§ I. *Of the species of Vanilla Plant which produces the long and fine pods of Commerce.*

Were we to believe most authors, (and I may even go so far as to say all) the *Vanilla aromatica* of Swartz, described by Robert Brown in the 'Hortus Kewensis' (vol. v.), would be the only one which produces the vanilla of commerce. This should have been the species introduced into Europe in 1739 by Henry Philip Miller; but it appears that it is not at all to be found at the present time in England, for I sought for it in vain in the gardens of London and its environs. I did not see it at Kew. It appears moreover that several species are confounded under this name, as M. Schiede has already pointed out in his *botanical observations* made in Mexico (Linnæa, vol. iv. 1829, p. 554—583), for, as he says, in Kunth's 'Synopsis,' we find assembled under this name Mexican species and others from Southern and Western America. The character which has been assigned to it of having nerved leaves (*foliis nervosis*) may possibly have arisen from bad culture, for in this case the *Vanilla planifolia* also has nerved leaves; or because dry leaves have been examined; for then again the leaves of the *Vanilla planifolia* are no longer smooth, but much wrinkled longitudinally, that is to say nerved. In short, the assertion that the pods of the vanilla of commerce are produced by the *Vanilla aromatica* rests upon no certain or known fact, but in a great measure upon the belief which existed that the *Vanilla planifolia* bore no odoriferous fruit, a thing which my own researches have proved to be completely false.

It is singular that there is not a better agreement with regard to the *Vanilla planifolia*, especially since the publications of M. Schiede. This botanist thinks that two distinct species are confounded under this name, both of which he found in Mexico; the one, the *Vanilla sativa*, Schiede, the leaves of which are oblong, succulent, the bracteæ small, and the *fruit without grooves*; and the other, the *Vanilla sylvestris*, Schiede, the leaves of which are oblong-lanceolate, succulent, the bracteæ small, and the *fruit with two grooves*. It is to be regretted that M. Schiede should have confined him-

§ I. *Of the species of Vanilla Plant which produces the long and fine pods of Commerce.*

Were we to believe most authors, (and I may even go so far as to say all) the *Vanilla aromatica* of Swartz, described by Robert Brown in the 'Hortus Kewensis' (vol. v.), would be the only one which produces the vanilla of commerce. This should have been the species introduced into Europe in 1739 by Henry Philip Miller; but it appears that it is not at all to be found at the present time in England, for I sought for it in vain in the gardens of London and its environs. I did not see it at Kew. It appears moreover that several species are confounded under this name, as M. Schiede has already pointed out in his *botanical observations* made in Mexico (Linnæa, vol. iv. 1829, p. 554—583), for, as he says, in Kunth's 'Synopsis,' we find assembled under this name Mexican species and others from Southern and Western America. The character which has been assigned to it of having nerved leaves (*foliis nervosis*) may possibly have arisen from bad culture, for in this case the *Vanilla planifolia* also has nerved leaves; or because dry leaves have been examined; for then again the leaves of the *Vanilla planifolia* are no longer smooth, but much wrinkled longitudinally, that is to say nerved. In short, the assertion that the pods of the vanilla of commerce are produced by the *Vanilla aromatica* rests upon no certain or known fact, but in a great measure upon the belief which existed that the *Vanilla planifolia* bore no odoriferous fruit, a thing which my own researches have proved to be completely false.

It is singular that there is not a better agreement with regard to the *Vanilla planifolia*, especially since the publications of M. Schiede. This botanist thinks that two distinct species are confounded under this name, both of which he found in Mexico; the one, the *Vanilla sativa*, Schiede, the leaves of which are oblong, succulent, the bracteæ small, and the *fruit without grooves*; and the other, the *Vanilla sylvestris*, Schiede, the leaves of which are oblong-lanceolate, succulent, the bracteæ small, and the *fruit with two grooves*. It is to be regretted that M. Schiede should have confined him-

§ I. *Of the species of Vanilla Plant which produces the long and fine pods of Commerce.*

Were we to believe most authors, (and I may even go so far as to say all) the *Vanilla aromatica* of Swartz, described by Robert Brown in the 'Hortus Kewensis' (vol. v.), would be the only one which produces the vanilla of commerce. This should have been the species introduced into Europe in 1739 by Henry Philip Miller; but it appears that it is not at all to be found at the present time in England, for I sought for it in vain in the gardens of London and its environs. I did not see it at Kew. It appears moreover that several species are confounded under this name, as M. Schiede has already pointed out in his *botanical observations* made in Mexico (Linnæa, vol. iv. 1829, p. 554—583), for, as he says, in Kunth's 'Synopsis,' we find assembled under this name Mexican species and others from Southern and Western America. The character which has been assigned to it of having nerved leaves (*foliis nervosis*) may possibly have arisen from bad culture, for in this case the *Vanilla planifolia* also has nerved leaves; or because dry leaves have been examined; for then again the leaves of the *Vanilla planifolia* are no longer smooth, but much wrinkled longitudinally, that is to say nerved. In short, the assertion that the pods of the vanilla of commerce are produced by the *Vanilla aromatica* rests upon no certain or known fact, but in a great measure upon the belief which existed that the *Vanilla planifolia* bore no odoriferous fruit, a thing which my own researches have proved to be completely false.

It is singular that there is not a better agreement with regard to the *Vanilla planifolia*, especially since the publications of M. Schiede. This botanist thinks that two distinct species are confounded under this name, both of which he found in Mexico; the one, the *Vanilla sativa*, Schiede, the leaves of which are oblong, succulent, the bracteæ small, and the *fruit without grooves*; and the other, the *Vanilla sylvestris*, Schiede, the leaves of which are oblong-lanceolate, succulent, the bracteæ small, and the *fruit with two grooves*. It is to be regretted that M. Schiede should have confined him-

self to these differential characters, so far from certain as to leave much doubt in the observer's mind, for he avows not having seen the flowers of any one species of *Vanilla*, and it is in the flower alone, and especially in the labellum, that the true characters are to be sought. There are in the hot-houses of Mr. Loddiges of London two kinds of Vanilla plant referred to the *Vanilla planifolia* of Andrews, to which these characters equally apply, and which are nevertheless very different, insomuch that the one has the leaves oblique and the other regular. It is moreover very doubtful, whether in the genus *Vanilla* all the fruits have not two grooves, which are the traces of the lines of dehiscence or of the sutures. These sutures also exist to the number of two upon the fruits which I saw upon the *Vanilla bicolor* at Mr. Loddiges, and which have recently been described by Professor Lindley.

From the form of the fruit of the Vanillas cultivated at Liége, it seems to me that the *Vanilla planifolia* of Andrews (Repository, vol. viii. pl. 538.), figured in his plate 538, is really the *Vanilla sylvestris* of Schiede; but I am not very sure of it, because the characters assigned to the *Vanilla pompona* of this latter author, and especially that of the size of the fruit, agree equally with the *Vanilla* of Liége; so that here again the want of all criterion drawn from the flower destroys any kind of certainty which might be had upon this subject. What is very certain is, that the *Vanilla planifolia* of the herbarium of Professor Lindley, although marked with a note of interrogation(?) is the very same plant drawn in flower by Mr. Francis Bauer in Lindley's 'Genera and Species of Orchideous Plants'; secondly, that this species is certainly the one which was figured by Andrews; and thirdly, that it is this same plant which, generally cultivated, on the continent, has produced at Liége an abundant crop of odorous and delicious fruit.

Hence, it follows:

1st. That the characters of the species of *Vanilla* named by M. Schiede *V. sativa*, *V. sylvestris*, *V. pompona*, should be submitted to a fresh examination, and that no sure distinction can be established except upon the flower, which has not yet been observed.

2nd. That whereas Andrews states that his *Vanilla planifolia*

self to these differential characters, so far from certain as to leave much doubt in the observer's mind, for he avows not having seen the flowers of any one species of *Vanilla*, and it is in the flower alone, and especially in the labellum, that the true characters are to be sought. There are in the hot-houses of Mr. Loddiges of London two kinds of Vanilla plant referred to the *Vanilla planifolia* of Andrews, to which these characters equally apply, and which are nevertheless very different, insomuch that the one has the leaves oblique and the other regular. It is moreover very doubtful, whether in the genus *Vanilla* all the fruits have not two grooves, which are the traces of the lines of dehiscence or of the sutures. These sutures also exist to the number of two upon the fruits which I saw upon the *Vanilla bicolor* at Mr. Loddiges, and which have recently been described by Professor Lindley.

From the form of the fruit of the Vanillas cultivated at Liége, it seems to me that the *Vanilla planifolia* of Andrews (Repository, vol. viii. pl. 538.), figured in his plate 538, is really the *Vanilla sylvestris* of Schiede; but I am not very sure of it, because the characters assigned to the *Vanilla pompona* of this latter author, and especially that of the size of the fruit, agree equally with the *Vanilla* of Liége; so that here again the want of all criterion drawn from the flower destroys any kind of certainty which might be had upon this subject. What is very certain is, that the *Vanilla planifolia* of the herbarium of Professor Lindley, although marked with a note of interrogation(?) is the very same plant drawn in flower by Mr. Francis Bauer in Lindley's 'Genera and Species of Orchideous Plants'; secondly, that this species is certainly the one which was figured by Andrews; and thirdly, that it is this same plant which, generally cultivated, on the continent, has produced at Liége an abundant crop of odorous and delicious fruit.

Hence, it follows:

1st. That the characters of the species of *Vanilla* named by M. Schiede *V. sativa*, *V. sylvestris*, *V. pompona*, should be submitted to a fresh examination, and that no sure distinction can be established except upon the flower, which has not yet been observed.

2nd. That whereas Andrews states that his *Vanilla planifolia*

self to these differential characters, so far from certain as to leave much doubt in the observer's mind, for he avows not having seen the flowers of any one species of *Vanilla*, and it is in the flower alone, and especially in the labellum, that the true characters are to be sought. There are in the hot-houses of Mr. Loddiges of London two kinds of Vanilla plant referred to the *Vanilla planifolia* of Andrews, to which these characters equally apply, and which are nevertheless very different, insomuch that the one has the leaves oblique and the other regular. It is moreover very doubtful, whether in the genus *Vanilla* all the fruits have not two grooves, which are the traces of the lines of dehiscence or of the sutures. These sutures also exist to the number of two upon the fruits which I saw upon the *Vanilla bicolor* at Mr. Loddiges, and which have recently been described by Professor Lindley.

From the form of the fruit of the Vanillas cultivated at Liége, it seems to me that the *Vanilla planifolia* of Andrews (Repository, vol. viii. pl. 538.), figured in his plate 538, is really the *Vanilla sylvestris* of Schiede; but I am not very sure of it, because the characters assigned to the *Vanilla pompona* of this latter author, and especially that of the size of the fruit, agree equally with the *Vanilla* of Liége; so that here again the want of all criterion drawn from the flower destroys any kind of certainty which might be had upon this subject. What is very certain is, that the *Vanilla planifolia* of the herbarium of Professor Lindley, although marked with a note of interrogation(?) is the very same plant drawn in flower by Mr. Francis Bauer in Lindley's 'Genera and Species of Orchideous Plants'; secondly, that this species is certainly the one which was figured by Andrews; and thirdly, that it is this same plant which, generally cultivated, on the continent, has produced at Liége an abundant crop of odorous and delicious fruit.

Hence, it follows:

1st. That the characters of the species of *Vanilla* named by M. Schiede *V. sativa*, *V. sylvestris*, *V. pompona*, should be submitted to a fresh examination, and that no sure distinction can be established except upon the flower, which has not yet been observed.

2nd. That whereas Andrews states that his *Vanilla planifolia*

self to these differential characters, so far from certain as to leave much doubt in the observer's mind, for he avows not having seen the flowers of any one species of *Vanilla*, and it is in the flower alone, and especially in the labellum, that the true characters are to be sought. There are in the hot-houses of Mr. Loddiges of London two kinds of Vanilla plant referred to the *Vanilla planifolia* of Andrews, to which these characters equally apply, and which are nevertheless very different, insomuch that the one has the leaves oblique and the other regular. It is moreover very doubtful, whether in the genus *Vanilla* all the fruits have not two grooves, which are the traces of the lines of dehiscence or of the sutures. These sutures also exist to the number of two upon the fruits which I saw upon the *Vanilla bicolor* at Mr. Loddiges, and which have recently been described by Professor Lindley.

From the form of the fruit of the Vanillas cultivated at Liége, it seems to me that the *Vanilla planifolia* of Andrews (Repository, vol. viii. pl. 538.), figured in his plate 538, is really the *Vanilla sylvestris* of Schiede; but I am not very sure of it, because the characters assigned to the *Vanilla pompona* of this latter author, and especially that of the size of the fruit, agree equally with the *Vanilla* of Liége; so that here again the want of all criterion drawn from the flower destroys any kind of certainty which might be had upon this subject. What is very certain is, that the *Vanilla planifolia* of the herbarium of Professor Lindley, although marked with a note of interrogation(?) is the very same plant drawn in flower by Mr. Francis Bauer in Lindley's 'Genera and Species of Orchideous Plants'; secondly, that this species is certainly the one which was figured by Andrews; and thirdly, that it is this same plant which, generally cultivated, on the continent, has produced at Liége an abundant crop of odorous and delicious fruit.

Hence, it follows:

1st. That the characters of the species of *Vanilla* named by M. Schiede *V. sativa*, *V. sylvestris*, *V. pompona*, should be submitted to a fresh examination, and that no sure distinction can be established except upon the flower, which has not yet been observed.

2nd. That whereas Andrews states that his *Vanilla planifolia*

is that of Plumier described in the unpublished collection of his drawings as having reddish fruit (*fructu corallino*) and short (*breviori*), and as having white flowers, there is an error either on the part of Plumier or of Andrews; for the fruits of the species figured as the *Vanilla planifolia* are extremely long (2 decimetres), and its flower is not white but green.

3rd. That the *Vanilla planifolia* of Andrews bears fine and good odoriferous fruit as long as the finest sort to be found in commerce, and that consequently this species, already much spread, may become very important, whether for cultivation in our hot-houses or for introduction into the intertropical colonies, two objects which merit as well the attention of private individuals as the protection of governments.

§ II. *An Abstract of the History of the* Vanilla planifolia *bearing large odoriferous fruits.*

I have followed Robert Brown's 'Vermischte botanische Schriften' (vol. ii. p. 48.) in attributing (in a notice respecting the indigenous Vanilla plant lately published at Brussels in the Bulletins of the Royal Academy of Sciences of Belgium, tom. iv. No. 5.) the introduction of *Vanilla planifolia* to the Honourable Charles Greville in 1800; but I have learnt here, at Newcastle itself, that this is a mistake. The useful Vanilla plant was first introduced into Europe by the present Duke of Marlborough, then Marquis of Blandford; but it is true that this interesting species was at first cultivated in the Honourable Charles Greville's choice collection of plants at Paddington, near London, where it flowered for the first time, but then no artificial fecundation having been performed no fruit was produced. In 1807 Mr. Bauer figured a new flower of this species from nature, together with one fruit; but the colour of the latter and its structure leave me some doubt whether this drawing was not made from a specimen of commerce, and there is nothing to authorize our believing that at this period the art of producing fruits in the *Orchideæ* was yet known.

The *Vanilla planifolia* was carried in 1812 from the gardens of Mr. Greville into those of Belgium, and it was M. Parmentier of Enghien who introduced the plant at Antwerp, where it was confided to the care of Dr. Sommé, the director

is that of Plumier described in the unpublished collection of his drawings as having reddish fruit (*fructu corallino*) and short (*breviori*), and as having white flowers, there is an error either on the part of Plumier or of Andrews; for the fruits of the species figured as the *Vanilla planifolia* are extremely long (2 decimetres), and its flower is not white but green.

3rd. That the *Vanilla planifolia* of Andrews bears fine and good odoriferous fruit as long as the finest sort to be found in commerce, and that consequently this species, already much spread, may become very important, whether for cultivation in our hot-houses or for introduction into the intertropical colonies, two objects which merit as well the attention of private individuals as the protection of governments.

§ II. *An Abstract of the History of the* Vanilla planifolia *bearing large odoriferous fruits.*

I have followed Robert Brown's 'Vermischte botanische Schriften' (vol. ii. p. 48.) in attributing (in a notice respecting the indigenous Vanilla plant lately published at Brussels in the Bulletins of the Royal Academy of Sciences of Belgium, tom. iv. No. 5.) the introduction of *Vanilla planifolia* to the Honourable Charles Greville in 1800; but I have learnt here, at Newcastle itself, that this is a mistake. The useful Vanilla plant was first introduced into Europe by the present Duke of Marlborough, then Marquis of Blandford; but it is true that this interesting species was at first cultivated in the Honourable Charles Greville's choice collection of plants at Paddington, near London, where it flowered for the first time, but then no artificial fecundation having been performed no fruit was produced. In 1807 Mr. Bauer figured a new flower of this species from nature, together with one fruit; but the colour of the latter and its structure leave me some doubt whether this drawing was not made from a specimen of commerce, and there is nothing to authorize our believing that at this period the art of producing fruits in the *Orchideæ* was yet known.

The *Vanilla planifolia* was carried in 1812 from the gardens of Mr. Greville into those of Belgium, and it was M. Parmentier of Enghien who introduced the plant at Antwerp, where it was confided to the care of Dr. Sommé, the director

is that of Plumier described in the unpublished collection of his drawings as having reddish fruit (*fructu corallino*) and short (*breviori*), and as having white flowers, there is an error either on the part of Plumier or of Andrews; for the fruits of the species figured as the *Vanilla planifolia* are extremely long (2 decimetres), and its flower is not white but green.

3rd. That the *Vanilla planifolia* of Andrews bears fine and good odoriferous fruit as long as the finest sort to be found in commerce, and that consequently this species, already much spread, may become very important, whether for cultivation in our hot-houses or for introduction into the intertropical colonies, two objects which merit as well the attention of private individuals as the protection of governments.

§ II. *An Abstract of the History of the* Vanilla planifolia *bearing large odoriferous fruits.*

I have followed Robert Brown's 'Vermischte botanische Schriften' (vol. ii. p. 48.) in attributing (in a notice respecting the indigenous Vanilla plant lately published at Brussels in the Bulletins of the Royal Academy of Sciences of Belgium, tom. iv. No. 5.) the introduction of *Vanilla planifolia* to the Honourable Charles Greville in 1800; but I have learnt here, at Newcastle itself, that this is a mistake. The useful Vanilla plant was first introduced into Europe by the present Duke of Marlborough, then Marquis of Blandford; but it is true that this interesting species was at first cultivated in the Honourable Charles Greville's choice collection of plants at Paddington, near London, where it flowered for the first time, but then no artificial fecundation having been performed no fruit was produced. In 1807 Mr. Bauer figured a new flower of this species from nature, together with one fruit; but the colour of the latter and its structure leave me some doubt whether this drawing was not made from a specimen of commerce, and there is nothing to authorize our believing that at this period the art of producing fruits in the *Orchideæ* was yet known.

The *Vanilla planifolia* was carried in 1812 from the gardens of Mr. Greville into those of Belgium, and it was M. Parmentier of Enghien who introduced the plant at Antwerp, where it was confided to the care of Dr. Sommé, the director

is that of Plumier described in the unpublished collection of his drawings as having reddish fruit (*fructu corallino*) and short (*breviori*), and as having white flowers, there is an error either on the part of Plumier or of Andrews; for the fruits of the species figured as the *Vanilla planifolia* are extremely long (2 decimetres), and its flower is not white but green.

3rd. That the *Vanilla planifolia* of Andrews bears fine and good odoriferous fruit as long as the finest sort to be found in commerce, and that consequently this species, already much spread, may become very important, whether for cultivation in our hot-houses or for introduction into the intertropical colonies, two objects which merit as well the attention of private individuals as the protection of governments.

§ II. *An Abstract of the History of the* Vanilla planifolia *bearing large odoriferous fruits.*

I have followed Robert Brown's 'Vermischte botanische Schriften' (vol. ii. p. 48.) in attributing (in a notice respecting the indigenous Vanilla plant lately published at Brussels in the Bulletins of the Royal Academy of Sciences of Belgium, tom. iv. No. 5.) the introduction of *Vanilla planifolia* to the Honourable Charles Greville in 1800; but I have learnt here, at Newcastle itself, that this is a mistake. The useful Vanilla plant was first introduced into Europe by the present Duke of Marlborough, then Marquis of Blandford; but it is true that this interesting species was at first cultivated in the Honourable Charles Greville's choice collection of plants at Paddington, near London, where it flowered for the first time, but then no artificial fecundation having been performed no fruit was produced. In 1807 Mr. Bauer figured a new flower of this species from nature, together with one fruit; but the colour of the latter and its structure leave me some doubt whether this drawing was not made from a specimen of commerce, and there is nothing to authorize our believing that at this period the art of producing fruits in the *Orchideæ* was yet known.

The *Vanilla planifolia* was carried in 1812 from the gardens of Mr. Greville into those of Belgium, and it was M. Parmentier of Enghien who introduced the plant at Antwerp, where it was confided to the care of Dr. Sommé, the director

of the Botanic Garden. The plant grew rapidly there, and slips were sent to all the towns of Belgium and of France, but they very rarely flowered; once or twice in Flanders at the seat of Madame la Vicomtesse Vilain XIV., and at Liége; but fruit was never obtained, so that this culture was despaired of. Nevertheless, in 1819, M. Sommé sent two plants of *Vanilla* to M. Marchal, now Curator of the Bibliothèque de Bourgogne at Brussels, that he might send them to the Dutch colonies of Java, where it was said the plant might become valuable by its produce.

The history of this migration of the Vanilla plant from America to the East Indies is too interesting not to be made known, because it brings to mind in every respect the episode of the transportation of the plant of the coffee tree taken from the hot-houses of Amsterdam, given to Louis XIV. and father of the three plants, one of which was taken to the French Antilles by Captain Declieux, who, in a scarcity of water experienced by the ship's crew, shared the small quantity which he had to drink between himself and his dear coffee plant. Indeed, only one of the Vanilla roots stood the passage from Belgium to the East Indies; but it was only by the greatest care in preserving it from the rough treatment of the sailors, from the changes of temperature, and from the salt water which was thrown upon it. It would undoubtedly have perished if M. Marchal had not made it his darling child. The plant so happily saved was given to the Botanic Garden of Buitenzorg at Java, and prospered there so well that it flowered; and it is without doubt, that which was afterwards described by Dr. Blume, who on account of its green flower named it *Vanilla viridiflora*; so that this name should also be regarded as a synonym of the specification, already so perplexed, of this species.

The observations on the necessity of an artificial fecundation in the greater part of the orchideous plants not being known at that time, the flowers of this *Vanilla* bore no fruit in the East Indies, which I attribute to the absence of the species of insect which nature has doubtless given to the climate of Mexico to effect in this latter region a fecundation, which man alone, by a study of the organs, is able to perfect in other countries.

of the Botanic Garden. The plant grew rapidly there, and slips were sent to all the towns of Belgium and of France, but they very rarely flowered; once or twice in Flanders at the seat of Madame la Vicomtesse Vilain XIV., and at Liége; but fruit was never obtained, so that this culture was despaired of. Nevertheless, in 1819, M. Sommé sent two plants of *Vanilla* to M. Marchal, now Curator of the Bibliothèque de Bourgogne at Brussels, that he might send them to the Dutch colonies of Java, where it was said the plant might become valuable by its produce.

The history of this migration of the Vanilla plant from America to the East Indies is too interesting not to be made known, because it brings to mind in every respect the episode of the transportation of the plant of the coffee tree taken from the hot-houses of Amsterdam, given to Louis XIV. and father of the three plants, one of which was taken to the French Antilles by Captain Declieux, who, in a scarcity of water experienced by the ship's crew, shared the small quantity which he had to drink between himself and his dear coffee plant. Indeed, only one of the Vanilla roots stood the passage from Belgium to the East Indies; but it was only by the greatest care in preserving it from the rough treatment of the sailors, from the changes of temperature, and from the salt water which was thrown upon it. It would undoubtedly have perished if M. Marchal had not made it his darling child. The plant so happily saved was given to the Botanic Garden of Buitenzorg at Java, and prospered there so well that it flowered; and it is without doubt, that which was afterwards described by Dr. Blume, who on account of its green flower named it *Vanilla viridiflora*; so that this name should also be regarded as a synonym of the specification, already so perplexed, of this species.

The observations on the necessity of an artificial fecundation in the greater part of the orchideous plants not being known at that time, the flowers of this *Vanilla* bore no fruit in the East Indies, which I attribute to the absence of the species of insect which nature has doubtless given to the climate of Mexico to effect in this latter region a fecundation, which man alone, by a study of the organs, is able to perfect in other countries.

of the Botanic Garden. The plant grew rapidly there, and slips were sent to all the towns of Belgium and of France, but they very rarely flowered; once or twice in Flanders at the seat of Madame la Vicomtesse Vilain XIV., and at Liége; but fruit was never obtained, so that this culture was despaired of. Nevertheless, in 1819, M. Sommé sent two plants of *Vanilla* to M. Marchal, now Curator of the Bibliothèque de Bourgogne at Brussels, that he might send them to the Dutch colonies of Java, where it was said the plant might become valuable by its produce.

The history of this migration of the Vanilla plant from America to the East Indies is too interesting not to be made known, because it brings to mind in every respect the episode of the transportation of the plant of the coffee tree taken from the hot-houses of Amsterdam, given to Louis XIV. and father of the three plants, one of which was taken to the French Antilles by Captain Declieux, who, in a scarcity of water experienced by the ship's crew, shared the small quantity which he had to drink between himself and his dear coffee plant. Indeed, only one of the Vanilla roots stood the passage from Belgium to the East Indies; but it was only by the greatest care in preserving it from the rough treatment of the sailors, from the changes of temperature, and from the salt water which was thrown upon it. It would undoubtedly have perished if M. Marchal had not made it his darling child. The plant so happily saved was given to the Botanic Garden of Buitenzorg at Java, and prospered there so well that it flowered; and it is without doubt, that which was afterwards described by Dr. Blume, who on account of its green flower named it *Vanilla viridiflora*; so that this name should also be regarded as a synonym of the specification, already so perplexed, of this species.

The observations on the necessity of an artificial fecundation in the greater part of the orchideous plants not being known at that time, the flowers of this *Vanilla* bore no fruit in the East Indies, which I attribute to the absence of the species of insect which nature has doubtless given to the climate of Mexico to effect in this latter region a fecundation, which man alone, by a study of the organs, is able to perfect in other countries.

of the Botanic Garden. The plant grew rapidly there, and slips were sent to all the towns of Belgium and of France, but they very rarely flowered; once or twice in Flanders at the seat of Madame la Vicomtesse Vilain XIV., and at Liége; but fruit was never obtained, so that this culture was despaired of. Nevertheless, in 1819, M. Sommé sent two plants of *Vanilla* to M. Marchal, now Curator of the Bibliothèque de Bourgogne at Brussels, that he might send them to the Dutch colonies of Java, where it was said the plant might become valuable by its produce.

The history of this migration of the Vanilla plant from America to the East Indies is too interesting not to be made known, because it brings to mind in every respect the episode of the transportation of the plant of the coffee tree taken from the hot-houses of Amsterdam, given to Louis XIV. and father of the three plants, one of which was taken to the French Antilles by Captain Declieux, who, in a scarcity of water experienced by the ship's crew, shared the small quantity which he had to drink between himself and his dear coffee plant. Indeed, only one of the Vanilla roots stood the passage from Belgium to the East Indies; but it was only by the greatest care in preserving it from the rough treatment of the sailors, from the changes of temperature, and from the salt water which was thrown upon it. It would undoubtedly have perished if M. Marchal had not made it his darling child. The plant so happily saved was given to the Botanic Garden of Buitenzorg at Java, and prospered there so well that it flowered; and it is without doubt, that which was afterwards described by Dr. Blume, who on account of its green flower named it *Vanilla viridiflora*; so that this name should also be regarded as a synonym of the specification, already so perplexed, of this species.

The observations on the necessity of an artificial fecundation in the greater part of the orchideous plants not being known at that time, the flowers of this *Vanilla* bore no fruit in the East Indies, which I attribute to the absence of the species of insect which nature has doubtless given to the climate of Mexico to effect in this latter region a fecundation, which man alone, by a study of the organs, is able to perfect in other countries.

It was in 1836 that by a peculiar horticultural treatment we had at Liége upon one Vanilla plant fifty-four flowers, which having been fecundated by me, produced the same number of pods; and in 1837 a fresh crop of about a hundred pods was obtained upon another plant by the same methods; so that now there is not the least doubt of the complete success of this new cultivation.

§ III. *Short Digression on the Introduction of Vanilla into domestic use.*

From the works of the illustrious Alexander von Humboldt we learn that the Mexicans were already in the habit of perfuming their chocolate when the Spaniards discovered this part of America. It seems, however, by the accounts which I have read of the first travellers in this region, that the American chocolate was a detestable beverage to which the Europeans afterwards gave an exquisite flavour. Chocolate was brought from Mexico into Europe in 1520, but it appears that vanilla was brought to the continent as a perfume about the year 1510, at the same time as indigo, cochineal, and cacao itself, that is to say, ten years before the arrival of tobacco. Nevertheless, as I have elsewhere said, 'Notice sur la Vanille,' Bruxelles, in spite of its perfume, so sweet that Salisbury at a later period called the plant *Myrobroma*, vanilla cannot have acquired a very great popularity about that period; for Claude d'Abbeville, whose singular 'History of the Mission of the Capuchin Fathers in the Island of Maragnan and the neighbouring lands,' published in 1614, I have consulted, says nothing of this plant, although he devotes an especial chapter to the history of the vegetables which are useful or curious, as the pine apple, of fruit trees, as the palm tree, &c. At a much later period it engaged but very slightly the attention of travellers, and I shall quote among others Father Gurailla, who in his 'Natural, Civil, and Geographical History of the Nations inhabiting the banks of the Orinoko,' mentions the vanilla (*Bagnilla*) merely as being a sarmentose plant always green and twining itself around trees.

In 1703, vanilla was better known from the writings of Charles Plumier. At that time its use was diffused over the

It was in 1836 that by a peculiar horticultural treatment we had at Liége upon one Vanilla plant fifty-four flowers, which having been fecundated by me, produced the same number of pods; and in 1837 a fresh crop of about a hundred pods was obtained upon another plant by the same methods; so that now there is not the least doubt of the complete success of this new cultivation.

§ III. *Short Digression on the Introduction of Vanilla into domestic use.*

From the works of the illustrious Alexander von Humboldt we learn that the Mexicans were already in the habit of perfuming their chocolate when the Spaniards discovered this part of America. It seems, however, by the accounts which I have read of the first travellers in this region, that the American chocolate was a detestable beverage to which the Europeans afterwards gave an exquisite flavour. Chocolate was brought from Mexico into Europe in 1520, but it appears that vanilla was brought to the continent as a perfume about the year 1510, at the same time as indigo, cochineal, and cacao itself, that is to say, ten years before the arrival of tobacco. Nevertheless, as I have elsewhere said, 'Notice sur la Vanille,' Bruxelles, in spite of its perfume, so sweet that Salisbury at a later period called the plant *Myrobroma*, vanilla cannot have acquired a very great popularity about that period; for Claude d'Abbeville, whose singular 'History of the Mission of the Capuchin Fathers in the Island of Maragnan and the neighbouring lands,' published in 1614, I have consulted, says nothing of this plant, although he devotes an especial chapter to the history of the vegetables which are useful or curious, as the pine apple, of fruit trees, as the palm tree, &c. At a much later period it engaged but very slightly the attention of travellers, and I shall quote among others Father Gurailla, who in his 'Natural, Civil, and Geographical History of the Nations inhabiting the banks of the Orinoko,' mentions the vanilla (*Bagnilla*) merely as being a sarmentose plant always green and twining itself around trees.

In 1703, vanilla was better known from the writings of Charles Plumier. At that time its use was diffused over the

It was in 1836 that by a peculiar horticultural treatment we had at Liége upon one Vanilla plant fifty-four flowers, which having been fecundated by me, produced the same number of pods; and in 1837 a fresh crop of about a hundred pods was obtained upon another plant by the same methods; so that now there is not the least doubt of the complete success of this new cultivation.

§ III. *Short Digression on the Introduction of Vanilla into domestic use.*

From the works of the illustrious Alexander von Humboldt we learn that the Mexicans were already in the habit of perfuming their chocolate when the Spaniards discovered this part of America. It seems, however, by the accounts which I have read of the first travellers in this region, that the American chocolate was a detestable beverage to which the Europeans afterwards gave an exquisite flavour. Chocolate was brought from Mexico into Europe in 1520, but it appears that vanilla was brought to the continent as a perfume about the year 1510, at the same time as indigo, cochineal, and cacao itself, that is to say, ten years before the arrival of tobacco. Nevertheless, as I have elsewhere said, 'Notice sur la Vanille,' Bruxelles, in spite of its perfume, so sweet that Salisbury at a later period called the plant *Myrobroma*, vanilla cannot have acquired a very great popularity about that period; for Claude d'Abbeville, whose singular 'History of the Mission of the Capuchin Fathers in the Island of Maragnan and the neighbouring lands,' published in 1614, I have consulted, says nothing of this plant, although he devotes an especial chapter to the history of the vegetables which are useful or curious, as the pine apple, of fruit trees, as the palm tree, &c. At a much later period it engaged but very slightly the attention of travellers, and I shall quote among others Father Gurailla, who in his 'Natural, Civil, and Geographical History of the Nations inhabiting the banks of the Orinoko,' mentions the vanilla (*Bagnilla*) merely as being a sarmentose plant always green and twining itself around trees.

In 1703, vanilla was better known from the writings of Charles Plumier. At that time its use was diffused over the

It was in 1836 that by a peculiar horticultural treatment we had at Liége upon one Vanilla plant fifty-four flowers, which having been fecundated by me, produced the same number of pods; and in 1837 a fresh crop of about a hundred pods was obtained upon another plant by the same methods; so that now there is not the least doubt of the complete success of this new cultivation.

§ III. *Short Digression on the Introduction of Vanilla into domestic use.*

From the works of the illustrious Alexander von Humboldt we learn that the Mexicans were already in the habit of perfuming their chocolate when the Spaniards discovered this part of America. It seems, however, by the accounts which I have read of the first travellers in this region, that the American chocolate was a detestable beverage to which the Europeans afterwards gave an exquisite flavour. Chocolate was brought from Mexico into Europe in 1520, but it appears that vanilla was brought to the continent as a perfume about the year 1510, at the same time as indigo, cochineal, and cacao itself, that is to say, ten years before the arrival of tobacco. Nevertheless, as I have elsewhere said, 'Notice sur la Vanille,' Bruxelles, in spite of its perfume, so sweet that Salisbury at a later period called the plant *Myrobroma*, vanilla cannot have acquired a very great popularity about that period; for Claude d'Abbeville, whose singular 'History of the Mission of the Capuchin Fathers in the Island of Maragnan and the neighbouring lands,' published in 1614, I have consulted, says nothing of this plant, although he devotes an especial chapter to the history of the vegetables which are useful or curious, as the pine apple, of fruit trees, as the palm tree, &c. At a much later period it engaged but very slightly the attention of travellers, and I shall quote among others Father Gurailla, who in his 'Natural, Civil, and Geographical History of the Nations inhabiting the banks of the Orinoko,' mentions the vanilla (*Bagnilla*) merely as being a sarmentose plant always green and twining itself around trees.

In 1703, vanilla was better known from the writings of Charles Plumier. At that time its use was diffused over the

continent; and in 1773 Fusée Aublet described the preparations of this fruit, which subject M. Schiede resumed in 1829. At the present time it is an important object of the commerce of the Mexicans, as may be learnt from the works of M. von Humboldt.

§ IV. *Detailed Description of the Cultivation of the Vanilla.*

I find that the *Vanilla planifolia* is as common in the gardens of the British Islands as in those of the continent, but the complaint there generally is that it very rarely flowers. I attribute this want of flowering to two causes; 1st, that almost everywhere the plants are too small, too young, and that they are not allowed to grow freely in the most lofty heated and humid houses; 2ndly, that a peculiar culture is not bestowed on them. I shall try to make good these two assertions.

The Vanilla plant in order to flower should be at least five or six years old. The older and larger it is, and the more branches it has, the better and more abundantly it will flower. Nevertheless, the number of flowers is not in direct proportion to the vigour of a plant; for I have two plants thirty feet high, but perhaps about a hundred feet long, one of which is much more feeble and sickly than the other, and the weakest bears more flowers than the stronger one. The quantity of flowers has more relation to the situation than any other circumstance; but in general old plants are necessary, and horticulturists are quite wrong in throwing away their old plants.

Secondly.—I have found by experience that the best method of cultivating the Vanilla is the following:

The *situation* should be shady; being behind and around palm trees and Dracænas, &c. suits it, at the back part of the hot-house, getting sun at intervals, although the sun is not necessary for ripening the fruit. Shade, heat, and humidity are three requisites for obtaining flowers.

The *soil* which I have found the best is simply *coack* or burnt coal, without mixture of earth, and above white wood poplar, or birch, crushed and reduced into small pieces; frequent watering; an iron column, a stem of *Dracæna*, or any other support will aid the climbing of the plant, which sends

continent; and in 1773 Fusée Aublet described the preparations of this fruit, which subject M. Schiede resumed in 1829. At the present time it is an important object of the commerce of the Mexicans, as may be learnt from the works of M. von Humboldt.

§ IV. *Detailed Description of the Cultivation of the Vanilla.*

I find that the *Vanilla planifolia* is as common in the gardens of the British Islands as in those of the continent, but the complaint there generally is that it very rarely flowers. I attribute this want of flowering to two causes; 1st, that almost everywhere the plants are too small, too young, and that they are not allowed to grow freely in the most lofty heated and humid houses; 2ndly, that a peculiar culture is not bestowed on them. I shall try to make good these two assertions.

The Vanilla plant in order to flower should be at least five or six years old. The older and larger it is, and the more branches it has, the better and more abundantly it will flower. Nevertheless, the number of flowers is not in direct proportion to the vigour of a plant; for I have two plants thirty feet high, but perhaps about a hundred feet long, one of which is much more feeble and sickly than the other, and the weakest bears more flowers than the stronger one. The quantity of flowers has more relation to the situation than any other circumstance; but in general old plants are necessary, and horticulturists are quite wrong in throwing away their old plants.

Secondly.—I have found by experience that the best method of cultivating the Vanilla is the following:

The *situation* should be shady; being behind and around palm trees and Dracænas, &c. suits it, at the back part of the hot-house, getting sun at intervals, although the sun is not necessary for ripening the fruit. Shade, heat, and humidity are three requisites for obtaining flowers.

The *soil* which I have found the best is simply *coack* or burnt coal, without mixture of earth, and above white wood poplar, or birch, crushed and reduced into small pieces; frequent watering; an iron column, a stem of *Dracæna*, or any other support will aid the climbing of the plant, which sends

continent; and in 1773 Fusée Aublet described the preparations of this fruit, which subject M. Schiede resumed in 1829. At the present time it is an important object of the commerce of the Mexicans, as may be learnt from the works of M. von Humboldt.

§ IV. *Detailed Description of the Cultivation of the Vanilla.*

I find that the *Vanilla planifolia* is as common in the gardens of the British Islands as in those of the continent, but the complaint there generally is that it very rarely flowers. I attribute this want of flowering to two causes; 1st, that almost everywhere the plants are too small, too young, and that they are not allowed to grow freely in the most lofty heated and humid houses; 2ndly, that a peculiar culture is not bestowed on them. I shall try to make good these two assertions.

The Vanilla plant in order to flower should be at least five or six years old. The older and larger it is, and the more branches it has, the better and more abundantly it will flower. Nevertheless, the number of flowers is not in direct proportion to the vigour of a plant; for I have two plants thirty feet high, but perhaps about a hundred feet long, one of which is much more feeble and sickly than the other, and the weakest bears more flowers than the stronger one. The quantity of flowers has more relation to the situation than any other circumstance; but in general old plants are necessary, and horticulturists are quite wrong in throwing away their old plants.

Secondly.—I have found by experience that the best method of cultivating the Vanilla is the following:

The *situation* should be shady; being behind and around palm trees and Dracænas, &c. suits it, at the back part of the hot-house, getting sun at intervals, although the sun is not necessary for ripening the fruit. Shade, heat, and humidity are three requisites for obtaining flowers.

The *soil* which I have found the best is simply *coack* or burnt coal, without mixture of earth, and above white wood poplar, or birch, crushed and reduced into small pieces; frequent watering; an iron column, a stem of *Dracæna*, or any other support will aid the climbing of the plant, which sends

continent; and in 1773 Fusée Aublet described the preparations of this fruit, which subject M. Schiede resumed in 1829. At the present time it is an important object of the commerce of the Mexicans, as may be learnt from the works of M. von Humboldt.

§ IV. *Detailed Description of the Cultivation of the Vanilla.*

I find that the *Vanilla planifolia* is as common in the gardens of the British Islands as in those of the continent, but the complaint there generally is that it very rarely flowers. I attribute this want of flowering to two causes; 1st, that almost everywhere the plants are too small, too young, and that they are not allowed to grow freely in the most lofty heated and humid houses; 2ndly, that a peculiar culture is not bestowed on them. I shall try to make good these two assertions.

The Vanilla plant in order to flower should be at least five or six years old. The older and larger it is, and the more branches it has, the better and more abundantly it will flower. Nevertheless, the number of flowers is not in direct proportion to the vigour of a plant; for I have two plants thirty feet high, but perhaps about a hundred feet long, one of which is much more feeble and sickly than the other, and the weakest bears more flowers than the stronger one. The quantity of flowers has more relation to the situation than any other circumstance; but in general old plants are necessary, and horticulturists are quite wrong in throwing away their old plants.

Secondly.—I have found by experience that the best method of cultivating the Vanilla is the following:

The *situation* should be shady; being behind and around palm trees and Dracænas, &c. suits it, at the back part of the hot-house, getting sun at intervals, although the sun is not necessary for ripening the fruit. Shade, heat, and humidity are three requisites for obtaining flowers.

The *soil* which I have found the best is simply *coack* or burnt coal, without mixture of earth, and above white wood poplar, or birch, crushed and reduced into small pieces; frequent watering; an iron column, a stem of *Dracæna*, or any other support will aid the climbing of the plant, which sends

forth numerous aërial roots without giving it the quality of a parasite. In fact, *Vanilla* is not in the least a parasitical plant.

The *culture* consists in twining the branches, cutting, and burning them at their extremity with a hot iron: everything that contributes to stop the sap serves to bring it into flowering state. If a plant blossoms and its flowers are not fecundated, it bears new flowers in the following year; but if it has produced fruit, some years of rest are necessary before it flowers again. The time of its flowering is from February to April, and when it bears fruit they need exactly a year and a day to ripen: this fact has constantly been confirmed at Liége. As the fruit ripens, it falls, and maturation takes place without the aid of the plant.

§ V. *On the Structure of the Flowers of the Vanilla Plant.*

The flower of *Vanilla* has this peculiarity—that the retinaculum is highly developed, so that this organ forms a curtain suspended before and above the stigmatic surface, thus separating it completely from the anther, which in its turn incloses in two cavities, naturally shut, the pulverulent masses of pollen. From this structure it results, that all approximation of the sexes in this orchideous plant is naturally impossible. It is thus necessary either to raise the velamen or to cut it when the plant is to be fecundated, and to place in direct contact the pollen and the stigmatic surface. The fecundation never fails, and we may be convinced of its success by observing the flower some hours after the operation. If impregnation has been effected, the petals and sepals reverse inwardly, and the flower droops instead of remaining erect. So soon as the following day the ovarium elongates.

I followed the development of the pollen tube through the columnar tube and at the septa only to the ovules; but what is remarkable is, that it requires three weeks before the pollen tube seizes the nucleus of the ovule. The formation of this latter part is easily studied in this species, and I have verified on this plant the profound researches of Robert Brown, which are of the greatest accuracy.

The direct results of this memoir therefore go to prove that

forth numerous aërial roots without giving it the quality of a parasite. In fact, *Vanilla* is not in the least a parasitical plant.

The *culture* consists in twining the branches, cutting, and burning them at their extremity with a hot iron: everything that contributes to stop the sap serves to bring it into flowering state. If a plant blossoms and its flowers are not fecundated, it bears new flowers in the following year; but if it has produced fruit, some years of rest are necessary before it flowers again. The time of its flowering is from February to April, and when it bears fruit they need exactly a year and a day to ripen: this fact has constantly been confirmed at Liége. As the fruit ripens, it falls, and maturation takes place without the aid of the plant.

§ V. *On the Structure of the Flowers of the Vanilla Plant.*

The flower of *Vanilla* has this peculiarity—that the retinaculum is highly developed, so that this organ forms a curtain suspended before and above the stigmatic surface, thus separating it completely from the anther, which in its turn incloses in two cavities, naturally shut, the pulverulent masses of pollen. From this structure it results, that all approximation of the sexes in this orchideous plant is naturally impossible. It is thus necessary either to raise the velamen or to cut it when the plant is to be fecundated, and to place in direct contact the pollen and the stigmatic surface. The fecundation never fails, and we may be convinced of its success by observing the flower some hours after the operation. If impregnation has been effected, the petals and sepals reverse inwardly, and the flower droops instead of remaining erect. So soon as the following day the ovarium elongates.

I followed the development of the pollen tube through the columnar tube and at the septa only to the ovules; but what is remarkable is, that it requires three weeks before the pollen tube seizes the nucleus of the ovule. The formation of this latter part is easily studied in this species, and I have verified on this plant the profound researches of Robert Brown, which are of the greatest accuracy.

The direct results of this memoir therefore go to prove that

forth numerous aërial roots without giving it the quality of a parasite. In fact, *Vanilla* is not in the least a parasitical plant.

The *culture* consists in twining the branches, cutting, and burning them at their extremity with a hot iron: everything that contributes to stop the sap serves to bring it into flowering state. If a plant blossoms and its flowers are not fecundated, it bears new flowers in the following year; but if it has produced fruit, some years of rest are necessary before it flowers again. The time of its flowering is from February to April, and when it bears fruit they need exactly a year and a day to ripen: this fact has constantly been confirmed at Liége. As the fruit ripens, it falls, and maturation takes place without the aid of the plant.

§ V. *On the Structure of the Flowers of the Vanilla Plant.*

The flower of *Vanilla* has this peculiarity—that the retinaculum is highly developed, so that this organ forms a curtain suspended before and above the stigmatic surface, thus separating it completely from the anther, which in its turn incloses in two cavities, naturally shut, the pulverulent masses of pollen. From this structure it results, that all approximation of the sexes in this orchideous plant is naturally impossible. It is thus necessary either to raise the velamen or to cut it when the plant is to be fecundated, and to place in direct contact the pollen and the stigmatic surface. The fecundation never fails, and we may be convinced of its success by observing the flower some hours after the operation. If impregnation has been effected, the petals and sepals reverse inwardly, and the flower droops instead of remaining erect. So soon as the following day the ovarium elongates.

I followed the development of the pollen tube through the columnar tube and at the septa only to the ovules; but what is remarkable is, that it requires three weeks before the pollen tube seizes the nucleus of the ovule. The formation of this latter part is easily studied in this species, and I have verified on this plant the profound researches of Robert Brown, which are of the greatest accuracy.

The direct results of this memoir therefore go to prove that

forth numerous aërial roots without giving it the quality of a parasite. In fact, *Vanilla* is not in the least a parasitical plant.

The *culture* consists in twining the branches, cutting, and burning them at their extremity with a hot iron: everything that contributes to stop the sap serves to bring it into flowering state. If a plant blossoms and its flowers are not fecundated, it bears new flowers in the following year; but if it has produced fruit, some years of rest are necessary before it flowers again. The time of its flowering is from February to April, and when it bears fruit they need exactly a year and a day to ripen: this fact has constantly been confirmed at Liége. As the fruit ripens, it falls, and maturation takes place without the aid of the plant.

§ V. *On the Structure of the Flowers of the Vanilla Plant.*

The flower of *Vanilla* has this peculiarity—that the retinaculum is highly developed, so that this organ forms a curtain suspended before and above the stigmatic surface, thus separating it completely from the anther, which in its turn incloses in two cavities, naturally shut, the pulverulent masses of pollen. From this structure it results, that all approximation of the sexes in this orchideous plant is naturally impossible. It is thus necessary either to raise the velamen or to cut it when the plant is to be fecundated, and to place in direct contact the pollen and the stigmatic surface. The fecundation never fails, and we may be convinced of its success by observing the flower some hours after the operation. If impregnation has been effected, the petals and sepals reverse inwardly, and the flower droops instead of remaining erect. So soon as the following day the ovarium elongates.

I followed the development of the pollen tube through the columnar tube and at the septa only to the ovules; but what is remarkable is, that it requires three weeks before the pollen tube seizes the nucleus of the ovule. The formation of this latter part is easily studied in this species, and I have verified on this plant the profound researches of Robert Brown, which are of the greatest accuracy.

The direct results of this memoir therefore go to prove that